



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/882,538	06/15/2001	Alexander Kalnitsky	60305-307201	8283

25696 7590 02/15/2002

OPPENHEIMER WOLFF & DONNELLY
P. O. BOX 10356
PALO ALTO, CA 94303

EXAMINER

FARAHANI, DANA

ART UNIT	PAPER NUMBER
----------	--------------

2814

DATE MAILED: 02/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/882,538

Applicant(s)

KALNITSKY ET AL.

Examiner

Dana Farahani

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 6, 8-11, 13, and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ryum et al., hereinafter Ryum (U.S. 6,337,494) in view of Kubota (U.S. 6,323,530).

Regarding claims 1, 8, and 15, Ryum discloses a method comprising the steps of providing a semiconductor substrate having a buried collector region; providing multiple layers above the collector region (see column 4, lines 1-8); providing three vertical etchings of the multiple layers (see column 4, lines 43-49); providing a window mask above the multiple layers; providing a doping of the collector region (see column 4, lines 62-68); providing a base region above the collector region; and providing an emitter region above the base region (see column 4, lines 10-24). Ryum does not disclose horizontal and wet etching are used. Kubota discloses horizontal and wet etching are used conventionally in the art as etching methods (see column 2, lines 34-41).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use these commonly used etching method in order to etch the layers above the buried collector layer.

Art Unit: 2814

Regarding claims 2, 6, 9, and 13, see column 4, lines 9-12 and 43-49; and figure 3, where layers 12 and 12-1 are base layers and 14 and 2 are emitter and collector layers, respectively.

Regarding claim 3, see column 4, lines 29-33.

Regarding claims 4, 10, 11, and 18, Ryum discloses a first and a second insulating film on the multiple layers, which are oxide and polysilicon (see column 4, lines 6-9). Ryum also discloses the first insulating film is an oxide (see column 4, lines 34-36). Ryum teaches to use silicon nitride in the multiple layers, as set forth in column 4, line 33. Therefore, it would have obvious to one of ordinary skill in the art at the time of the invention to use nitride as the second layer in order to make an insulating layer.

Regarding claims 16 and 17, see figures 4A-4L.

Regarding claims 19 and 20, Ryum discloses that the invention minimize the parasitic resistance of the base, hence improving power gain. It would have been obvious to one of ordinary skill in the art at the time of the invention to control the etching and the base thickness in order to have the desired power gain.

3. Claims 5, 7, 12, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ryum in view of Kubota, as applied to claim 1 above, and further in view of Streetman (Solid State Electronic Devices).

Regarding claims 5 and 12, Ryum in view of Kubota dose not discloses phosphorus or arsenic used in doping of the collector, using ion implantation. However, it is well known in the art to use these material and ion implantation in order to make n-type material (see Streetman, page 2, table1-1, column 5; and page 149, second

Art Unit: 2814

paragraph). Therefore, it would have obvious to one of ordinary skill in the art at the time of the invention to use phosphorus or Arsenic with ion implantation in order to make n-type material, and perform doping at a relatively low temperature, respectively.

Regarding claims 7, 14, Streetman discloses isotropic plasma etch is a common etching method (see page 155, the paragraph under the title Etching). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use this etching method to etch as fast horizontally as vertically.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (703)305-1914. The examiner can normally be reached on M-F 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703)306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Dana Farahani
February 4, 2002


OLIK CHAUDHURI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800